PATENT

WHAT IS CLAIMED IS:

1.   A method for settling an auction of contracts comprising:

    establishing a fill for orders in an auction pool without setting an auction settlement price

        (ASP) for the contracts in the auction pool; and

    based on the fill for the orders, setting the ASP for contracts in a qualified pool defined

        by the fill for the orders.

2.   The method of claim 1 wherein the step of establishing a fill for the orders in the auction

pool comprises:

    establishing a fill for the orders in the auction pool according to a price aggressiveness of

        the orders.

3.   The method of claim 2 wherein the step of establishing a fill for the orders in the auction

pool comprises:

    establishing a fill for the orders in the auction pool primarily according to a price

        aggressiveness of the orders; and for orders of the same price aggressiveness,

        secondarily according to a preselected priority factor other than price

        aggressiveness.

4.   The method of claim 3 wherein the preselected priority factor includes a time chop.

5.   The method of claim 1 wherein the step of establishing a fill for the orders in the auction

pool comprises:

    maximizing an aggregate price aggressiveness subject to constraints defined in the orders.

6.   The method of claim 5 wherein the step of establishing a fill for the orders in the auction

pool further comprises:

    maximizing an aggregate number of zero fill orders, subject to maximization of the

        aggregate price aggressiveness.

7.   The method of claim 1 wherein the step of establishing a fill for the orders in the auction pool comprises:

        performing an LP optimization.

8.   The method of claim 7 wherein the LP optimization maximizes an aggregate price aggressiveness subject to constraints defined in the orders.

9.   The method of claim 1 wherein the step of establishing a fill for the orders in the auction pool comprises:

        forming complete sets from the orders in the auction pool.

10.   The method of claim 9 wherein the step of forming complete sets from the orders in the auction pool comprises:

        forming complete sets from the orders in the auction pool and optionally also zero fill
                orders.

11.   The method of claim 9 wherein the step of establishing a fill for the orders in the auction pool further comprises:

        after forming complete sets from the orders, if any orders have non-integer fills, then
                reducing the fills by removing complete sets until all orders have integer fills.

12.   The method of claim 9 wherein the step of establishing a fill for the orders in the auction pool further comprises:

        after forming complete sets from the orders, adjusting fills determined by the complete
                sets according to constraints in the orders.

13.   The method of claim 1 wherein the step of establishing a fill for the orders in the auction pool comprises:

        performing an LP optimization that maximizes an aggregate price aggressiveness, subject
                to:

constraints defined in the orders; and

forming complete sets from the orders.

14.	The method of claim 12 wherein the constraints defined in the orders consists of: ·
quantity limits defined in the orders.

15.	The method of claim 12 wherein the step of establishing a fill for the orders in the auction pool further comprises:

within orders with a same price aggressiveness, establishing the fill according to a

preselected priority factor other than price aggressiveness.

16.	The method of claim 12 wherein the step of establishing a fill for the orders in the auction pool further comprises:

if any orders have non-integer fills, then reducing the fills by removing complete sets

until all orders have integer fills.

17.	The method of claim 12 wherein the step of establishing a fill for the orders in the auction pool further comprises:

after forming complete sets from the orders, adjusting fills determined by the complete

sets according to constraints in the orders.

18.	The method of claim 12 wherein the step of establishing a fill for the orders in the auction pool further comprises:

after maximizing the aggregate price aggressiveness, performing an LP optimization that

maximizes a fill for zero fill orders, subject to:

the constraints defined in the orders;

forming complete sets from the orders; and

maintaining the maximum aggregate price aggressiveness.

19.   The method of claim 17 wherein the step of establishing a fill for the orders in the auction pool further comprises:

after maximizing the aggregate number of zero fill orders, considering orders sequentially according to a preselected priority factor other than price aggressiveness and, for each order, maximizing the fill of the order subject to:

the constraints defined in the orders;

forming complete sets from the orders;

maintaining the maximum aggregate price aggressiveness;

maintaining the maximum fill for zero fill orders; and

maintaining the fill of previously considered orders.

20.   The method of claim 19 wherein the step of establishing a fill for the orders in the auction pool further comprises:

after maximizing the fill of the orders, if any orders have non-integer fills, then reducing the fills by removing complete sets until all orders have integer fills.

21.   The method of claim 1 wherein the step of setting the ASP for contracts in a qualified pool comprises:

determining a lower price bound and an upper price bound for contracts according to price constraints defined in the orders and further according to the fill for the orders; and

selecting the ASP for contracts to fall within a range defined by the lower price bound and the upper price bound.

22.   The method of claim 21 wherein the step of determining a lower price bound and an upper price bound comprises:

performing LP and/or QP optimizations to determine the lower price bound and the upper price bound for contracts, subject to price constraints defined in the orders and further according to the fill for the orders.

23.   The method of claim 21 wherein the step of determining a lower price bound and an upper price bound for contracts is further according to price constraints defined only in orders that are in the qualified pool.

24.   The method of claim 21 wherein the step of determining a lower price bound and an upper price bound for contracts is further according to price constraints defined only in orders that are not in the qualified pool.

25.   The method of claim 21 wherein the step of determining a lower price bound and an upper price bound for contracts is further according to price constraints defined in orders that are in the qualified pool and also according to price constraints defined in orders that are not in the qualified pool.

26.   The method of claim 21 wherein the step of selecting the ASP for contracts comprises:
         interpolating between the lower price bound and the upper price bound for the contracts.

27.   The method of claim 1 wherein the step of setting the ASP for contracts in a qualified pool comprises:
         performing an LP optimization.

28.   The method of claim 1 wherein the step of setting the ASP for contracts in a qualified pool comprises:
         performing a QP optimization.

29.   The method of claim 1 wherein the step of setting the ASP for contracts in a qualified pool comprises:
         limiting a risk due to deviation of the qualified pool from complete sets.

30.   The method of claim 1 further comprising:
         expressing orders in the auction pool in terms of basic units wherein:

the step of establishing a fill for the orders in the auction pool comprises

establishing the fill for the orders based on the expression of the orders in

terms of basic units; and

the step of setting the ASP for contracts in a qualified pool comprises setting the

ASP for contracts in a qualified pool based on the expression of the

contracts in terms of basic units.

31.   The method of claim 30 wherein the basic units are mutually exclusive and collectively exhaustive.

32.   The method of claim 31 wherein all of the basic units have a same notional.

33.   The method of claim 30 wherein the step of setting the ASP for contracts in a qualified pool comprises:

determining a lower price bound and an upper price bound for each basic unit according

to price constraints defined in the orders and further according to the fill for the

orders;

selecting the ASP for basic units to fall within a range defined by the lower price bound

and the upper price bound; and

setting the ASP for contracts based on the ASPs for basic units.

34.   The method of claim 33 wherein the step of determining a lower price bound and an upper price bound for each basic unit comprises:

performing LP and/or QP optimizations to determine the lower price bound and the upper

price bound for each basic unit, subject to price constraints defined in the orders

and further according to the fill for the orders.

35.   The method of claim 33 wherein the step of determining a lower price bound and an upper price bound for each basic unit comprises:

maximizing a difference between the lower price bound and the upper price bound for the

basic unit.

36.   The method of claim 33 wherein the step of determining a lower price bound and an

upper price bound for each basic unit comprises:

minimizing a sum of variances of the lower price bound and the upper price bound from a

preselected price for the basic unit.

37.   The method of claim 33 wherein the step of selecting the ASP for a basic unit comprises:

interpolating between the lower price bound and the upper price bound for the basic unit.

38.   The method of claim 37 wherein the step of selecting the ASP for a basic unit comprises:

linearly interpolating between the lower price bound and the upper price bound for the

basic unit.

39.   A computer readable medium containing instructions to cause a processor to execute a

method for settling an auction of contracts comprising:

establishing a fill for orders in an auction pool without setting an auction settlement price

(ASP) for the contracts in the auction pool; and

based on the fill for the orders, setting the ASP for contracts in a qualified pool defined

by the fill for the orders.

40.   A system for settling an auction of contracts comprising:

a fill module for establishing a fill for orders in an auction pool without setting an auction

settlement price (ASP) for the contracts in the auction pool; and

a pricing module coupled to the fill module for, based on the fill for the orders, setting the

ASP for contracts in a qualified pool defined by the fill for the orders.